Date: Tue, 24 Aug 93 04:30:29 PDT
From: Ham-Homebrew Mailing List and Newsgroup <ham-homebrew@ucsd.edu>
Errors-To: Ham-Homebrew-Errors@UCSD.Edu
Reply-To: Ham-Homebrew@UCSD.Edu
Precedence: Bulk
Subject: Ham-Homebrew Digest V93 #20
To: Ham-Homebrew

Ham-Homebrew Digest Tue, 24 Aug 93 Volume 93 : Issue 20

Today's Topics:

Send Replies or notes for publication to: <Ham-Homebrew@UCSD.Edu>
Send subscription requests to: <Ham-Homebrew-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Ham-Homebrew Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/ham-homebrew".

Date: Mon, 23 Aug 93 18:49:59 CDT
From: tribune.usask.ca!mizar.cc.umanitoba.ca!bison!sys6626!inqmind!
bills@decwrl.dec.com
Subject: "Julieboard" info
To: ham-homebrew@ucsd.edu

I just got a (paper) letter from the author of the Julieboard article;
the blank board is $33, an assembled and tested unit is $160 with a
33 MHZ synthesizer in it, and the "partial kit" with pcb, manual, filter,
and DDS chip is $115.   All prices in $ Canadian, and add $5 or so for
shipping. Oh, and 7% contribution to reducing the national debt.
  Bill
(who isn't even (yet) a satisfied customer, just curious)

bills@inqmind.bison.mb.ca
The Inquiring Mind BBS, Winnipeg, Manitoba 204 488-1607

Date: Mon, 23 Aug 1993 21:15:48 GMT
From: mvb.saic.com!unogate!news.service.uci.edu!usc!howland.reston.ans.net!
usenet.ins.cwru.edu!nshore!seastar!jjw@network.ucsd.edu
Subject: Combining filters to make a bandpassRe:
To: ham-homebrew@ucsd.edu

I'm looking for a way to put 2 filters in series, a high-pass and a
low-pass, to make a wide bandpass RF filter. When I just plugged one
into the other, it seemed to not work even though each individual
filter did work.

I would like to use this as both an output and input filter, running
upwards of 20 watts through it. Should I put an isolation transformer
(1:1) in the middle? Any help would be appreciated.
-->jjw

--

John Welch, N9JZW

Date: 24 Aug 93 08:59:45 GMT
From: koriel!sh.wide!wnoc-tyo-news!hitwide!hinocgw!hcrlgw92!harlgw92!
motoyama@decwrl.dec.com
Subject: Electro-nostalgia CHALLENGE; was: Re: Why aren't electronics cool any
more?
To: ham-homebrew@ucsd.edu

In article <253afaINN9md@rave.larc.nasa.gov> kludge@grissom.larc.nasa.gov (Scott
Dorsey) writes:

   >These are subminis.

Yes. I constructed a superhet with five 5678's. All parts except tubes are
for transistor radios. The sensitivity was good. But I got troubled with micro-
phonic noise emanated from the tubes. The noise offen lasts for more than
ten seconds! I guess very fine filaments of tubes vibrate in high vacuum
environment. Vibration energy disipates only through inner loss of fillament
material.

Hiroshi Motoyama

--
Hiroshi Motoyama

Date: 23 Aug 1993 12:34:15 GMT
From: usc!howland.reston.ans.net!xlink.net!scsing.switch.ch!epflnews!
circhp3.epfl.ch!bora@network.ucsd.edu
Subject: Q: Project 3?
To: ham-homebrew@ucsd.edu

I have missed the third project!

Can it be posted again? Can anyone send me a copy?

bora

Date: Mon, 23 Aug 1993 14:15:47 GMT
From: pravda.sdsc.edu!news.cerf.net!usc!howland.reston.ans.net!math.ohio-
state.edu!magnus.acs.ohio-state.edu!csn!teal.csn.org!dfeldman@network.ucsd.edu
Subject: QRP type kits with DDS?
To: ham-homebrew@ucsd.edu

In article <CC10MB.CxC@hpcvsnz.cv.hp.com> davidc@lsid.hp.com (David Cook) writes:
>Are there any QRP type kits out there that use Direct Digital Synthesis for
>the VFO? Adding DDS to the C.M. Howes 10 & 15 meter CW/SSB kit would be just

I'd vote for a DDS-based replacement VFO for the Ten-Tec Argonaut 509. It (the
Argonaut) has a simple 5-range, bandswitched VFO (no heterodyne xtals), and
there should be enough room inside for a small shielded PC board and perhaps
an RS-232 connector in the back. The wafer of the bandswitch that selects
the VFO coil could probably be comandeered for selecting DDS mode, and the
RIT control is a single analog input to the VFO module that could be fed to
an 8-bit ADC (perhaps use a 68HC11 CPU w/ EEPROM to control the DDS). It
would make an interesting project - I think it's what Ten-Tec should have
built when they hatched the "Argonaut II" instead.

73 Dave WB0GAZ

Date: 24 Aug 93 02:13:53 GMT
From: ogicse!emory!darwin.sura.net!news-feed-2.peachnet.edu!hobbes.cc.uga.edu!
aisun3.ai.uga.edu!mcovingt@network.ucsd.edu
Subject: Ramsey FM transmitter kit?
To: ham-homebrew@ucsd.edu

Without the circuit diagram I can't make specific recommendations,
but you might want to see that all the ICs and transistors are getting
power (by making voltage measurements).

--
:- Michael A. Covington, Associate Research Scientist   :   *****
:- Artificial Intelligence Programs   mcovingt@ai.uga.edu : *********
:- The University of Georgia   phone 706 542-0358 :   * * *
:- Athens, Georgia 30602-7415 U.S.A.   amateur radio N4TMI : ** *** ** <><

Date: Mon, 23 Aug 1993 18:05:07 GMT
From: rocksanne!aladdin!chen@cs.rochester.edu
Subject: Ramsey FM transmitter kit?
To: ham-homebrew@ucsd.edu

I recently bought one of the kits that Ramsey Electronics puts out. I figure I would start out with a small project and work to a bigger one. I put the kit together and I don't think it works. It's supposed to transmit on FM somewhere between 88-108 Mhz. It's very low power so it's legal. Anyhow when I apply power to it. I tuned my walkman up and down the 88-108 Mhz and got nothing. I also adjusted the output transmitter on the kit up and down too. There is also a potentiometer for Audio gain. I ju

st set that to the middle.

My question is how a beginner would begin to determine what the problem is? Do I have to go out and buy alot of fancy and expensive equipment? Is there anything I can measure with my analog multimeter?

Thanks,
Dan N2PKE
chen.roch817@xerox.com

Date: Mon, 23 Aug 1993 18:04:09 -0400
From: dog.ee.lbl.gov!overload.lbl.gov!agate!usenet.ins.cwru.edu!magnus.acs.ohio-state.edu!cis.ohio-state.edu!news.sei.cmu.edu!bb3.andrew.cmu.edu!andrew.cmu.edu!ee2g+@network.ucsd.edu
Subject: SWR Meters
To: ham-homebrew@ucsd.edu

I have a SWR meter that was designed to be used for HF frequencies.
Is it possible to modify it to work on 2 meters?

It is a older version of the current Radio Shack SWR/FS meter
model number: 21-523. Now I realize that many people make cheep meters
(i.e. Radio Shack and MFJ inc.), but I need a project to bide me over
while waiting for my Code-Freed Tech. ticket to arrive
(9.5 weeks and counting!). It is also more in keeping with our hobby
to self-educate and to have "made it myself".

If someone would like to wax-eloquently on what exactly a SWR meter
is really measuring in term that this Electrical Engineer can understand,
I sure would appreciate it.

73's all
and be seeing you on the RF soon,
I hope!
Chuck Kamas
ee2g+Charles@andrew.cmu.edu

Date: Tue, 24 Aug 1993 02:12:40 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!gatech!kd4nc!
ke4zv!gary@network.ucsd.edu
Subject: SWR Meters
To: ham-homebrew@ucsd.edu

In article <ogSHvNm00jWR4KNnRP@andrew.cmu.edu> ee2g+Charles@andrew.cmu.edu writes:
> I have a SWR meter that was designed to be used for HF frequencies.
>Is it possible to modify it to work on 2 meters?

Yes, but all that's left of the original when you're done is the case
and meter movement. As I recall it's a form of the Monimatch circuit.
Basically that's a short transmission line segment that has an additional
wire inside the shield for a short distance. That wire is terminated
at one end by a resistor of the line's characteristic impedance, and
by a diode and a meter on the other end. There's usually a switch
so you can swap the line ends to measure forward and reflected signal
components, and a variable resistor to set the sensitivity of the
unit. This circuit can be used at VHF if the construction symmetry
is good enough, and if strays are controlled well enough. Unfortunately,
this style of instrument is frequency sensitive, and the pickup wire
offers too much coupling at VHF in order to get a reading at HF. And
this particular meter doesn't maintain symmetry, or control strays
very well. So you need to build a new line section to get reliable

readings at VHF.

>   It is a older version of the current Radio Shack SWR/FS meter
>model number: 21-523. Now I realize that many people make cheep meters
>(i.e. Radio Shack and MFJ inc.), but I need a project to bide me over
>while waiting for my Code-Freed Tech. ticket to arrive
>(9.5 weeks and counting!). It is also more in keeping with our hobby
>to self-educate and to have "made it myself".
>
>   If someone would like to wax-eloquently on what exactly a SWR meter
>is really measuring in term that this Electrical Engineer can understand,
>I sure would appreciate it.

Well what we usually actually measure is the line VSWR, the Voltage Standing Wave Ratio, though we could equally measure the Current Standing Wave Ratio, and we do in different kinds of bridge circuits. First a few basics.

A transmission line has a characteristic impedance. That's the impedance a generator would see if it impressed a pulse on an infinitely long line segment. This impedance exists because of the distributed inductance and capacitance of the line. Since that's purely reactive, no power is dissipated in the line, but since the line is infinitely long, it appears to the generator that the power has been dissipated in the "load" presented by the line. If we replace the infinite line segment with a finite length line and terminate it in a resistor of the line's characteristic impedance, from the generator's point of view nothing will have changed. That's called a perfectly matched line. As far as the generator is concerned, it's looking directly into a resistor of the line's characteristic impedance. If you take a voltage reading anywhere along the line, you'll get a value that's related to the generator's power by the relation E=sqrt(P*R) where E is the voltage, P is generator power, and R is the line characteristic impedance. Similarly, if you measured the current anywhere along the line, I=sqrt(P/R), and the current and voltage waveforms will be *in phase*. Remember we're dealing with AC here, and AC across a resistor will be in phase, and to the generator the line looks like a resistor.

Now suppose the line is *not* terminated in a resistor of the line's characteristic impedance. Let's first look at two extreme cases. If the line is *open*, then current will be zero and voltage will be maximum, a very high impedance point. Note that the voltage and current are now out of phase by 90 degrees. When the voltage collapses, it will induce a current in the wire that will travel in the opposite direction from the incoming wave, or forward wave, back toward the generator. Since it's moving along a line with a characteristic impedance, it will in turn generate a voltage on the line, also travelling toward the generator. Voltage and current waves will once again be in phase, but travelling in a different direction. This is called the reflected wave.

If the line is shorted instead of open, then voltage goes to zero, and current becomes maximum, a very low impedance. The same things happen to the waves as in the open case except that the signs of the phases are reversed. Now if we take the case where the line is terminated in a finite impedance, but different from the line's characteristic impedance, we'll get part of the incident wave absorbed in the load, and part reflected by the mismatch.

Ok, now what do we see if we measure the voltage along the line? Since we now have two waves, forward and reflected, moving along the same line, and that line has a characteristic impedance, we'll measure a voltage at any given point on the line that's the vector sum of the two waves at that point. Since the two waves differ in phase by the distance they've travelled along the line, we won't see a constant voltage. Instead we will see a sinewave variation of the voltage as we move along the line. Since the line is of fixed length, the travel time differences between the waves will be in a fixed relationship and this sinewave will appear to *stand* still on the line. Hence Standing Wave. The relationship between the forward and reflected voltages can be expressed as a ratio in the following form, VSWR=(Vf+Vr)/(Vf-Vr). Note that for a perfectly matched line Vr=0 and VSWR becomes simply Vf/Vf or 1. So an SWR of 1:1 means a perfect match.

Now this would all be pretty academic if we couldn't separate Vf and Vr so we could measure them. Various bridge type circuits can be used to separate the two wave components by taking advantage of non-reciprocal properties of the bridge circuit. We can also take advantage of the properties of travelling waves in the monimatch to do the same thing. It's difficult to show how to build a VSWR meter without drawings, so I'll refer you to the instrument on page 27-11 of The ARRL Antenna Book for a line section that will work at VHF/UHF and that can be made out of ordinary copper plumbing fixtures.

Gary
--
Gary Coffman KE4ZV | "If 10% is good enough | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | for Jesus, it's good | uunet!rsiatl!ke4zv!gary
534 Shannon Way | enough for Uncle Sam." | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | -Ray Stevens |

Date: 23 Aug 93 18:06:43 GMT
From: psinntp!cooper!mark@uunet.uu.net
Subject: Tx/Rx Interference?
To: ham-homebrew@ucsd.edu

Hello,

I am interested in installing a 75 MHz transmitter alongside a 72 MHz
receiver in a radio controlled airplane. The 72 MHz band is the
"Aircraft Only" control frequency. This receiver has a wire antenna
approximately 3 feet long. Would a 75 MHz "surface" transmitter
with a similar antenna alongside the receiver's antenna create
interference problems?

Thanks very much!

;
; Mark Balch   The Cooper Union
; mark@alf.cooper.edu   (212) 353-4350
; mark@magnum.cooper.edu   The Future is MPP!
;

Date: Mon, 23 Aug 1993 22:35:49 GMT
From: dog.ee.lbl.gov!overload.lbl.gov!agate!howland.reston.ans.net!gatech!emory!
wa4mei!ke4zv!gary@network.ucsd.edu
Subject: Tx/Rx Interference?
To: ham-homebrew@ucsd.edu

In article <1993Aug23.180643.3077@alf.cooper.edu> mark@alf.cooper.edu (Mark_Balch)
writes:
>Hello,
>
>I am interested in installing a 75 MHz transmitter alongside a 72 MHz
>receiver in a radio controlled airplane. The 72 MHz band is the
>"Aircraft Only" control frequency. This receiver has a wire antenna
>approximately 3 feet long. Would a 75 MHz "surface" transmitter
>with a similar antenna alongside the receiver's antenna create
>interference problems?

It could. It depends on the selectivity of the receiver's front
end stages, and the amount of power from the transmitter. Paralleling
the antenna wires is likely not a good idea as it would increase
coupling, and likely distort the antenna patterns.

If the transmitter is relatively low power, as we would assume,
then a simple lumped constant duplexer could allow sharing of
the single antenna wire. At low power levels, 10 mw or so, the
duplexer could be kept under a couple of ounces. A 3 MHz split
is easily possible.

Gary
--
Gary Coffman KE4ZV |"If 10% is good enough | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | for Jesus, it's good | uunet!rsiatl!ke4zv!gary
534 Shannon Way | enough for Uncle Sam."| emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | -Ray Stevens |

Date: Mon, 23 Aug 93 12:05:29 GMT
From: butch!rapnet!news@uunet.uu.net
Subject: Yagi antenna computer design doesn't match "the book"
To: ham-homebrew@ucsd.edu

I entered the free space element lengths and spacings for K1FO's 19
element 2 Meter Yagi from the 1993 ARRL Handbook. The text description says
it peaks in gain at 144.7 MHz. But, the YAGIMAX2 software says it peaks at
about 147 MHz.

This much error seems too much to do high optimized VHF/UHF antenna design.

Does anyone have an explanation? Using the free space dimensions
eliminates any boom or mast effects. Is it possible that YAGIMAX's
approximations (made for speed) have affected the results too much?

Thanks in advance...

The views expressed here are my own, not my employer's.
Jeff Millar, WA1HCO, Lockheed Sanders 603-885-7047

Date: Mon, 23 Aug 1993 14:27:43 GMT
From: elroy.jpl.nasa.gov!sdd.hp.com!col.hp.com!news.dtc.hp.com!srgenprp!
glenne@ames.arpa
Subject: Yagi antenna computer design doesn't match "the book"
To: ham-homebrew@ucsd.edu

Jeffrey R. Millar (millar@mervax.sanders.lockheed.com) wrote:
: I entered the free space element lengths and spacings for K1FO's 19
: element 2 Meter Yagi from the 1993 ARRL Handbook. The text description says
: it peaks in gain at 144.7 MHz. But, the YAGIMAX2 software says it peaks at
: about 147 MHz.

: Does anyone have an explanation? Using the free space dimensions

I have no experience with YAIMAX2 but...

Do the gains/patterns agree fairly well? If so, is it possible that the model isn't properly handling the effects of a conductive boom (assuming elements are mounted using one).

I expect modelling Long yagis is a fairly demanding test of a program however if it gets the gain and pattern right it could be something as simple as this.

Glenn "All models are wrong; some are useful" Elmore n6gn

Date: 23 Aug 93 22:18:32 GMT
From: butch!rapnet!news@uunet.uu.net
Subject: Yagi antenna computer design doesn't match "the book"
To: ham-homebrew@ucsd.edu

In article <CC7uu7.In6@srgenprp.sr.hp.com> glenne@sad.hp.com (Glenn Elmore) writes:
>From: glenne@sad.hp.com (Glenn Elmore)
>Subject: Re: Yagi antenna computer design doesn't match "the book"
>Date: Mon, 23 Aug 1993 14:27:43 GMT

...some stuff deleted for brevity...

> If so, is it possible that the model isn't properly handling the effects
> of a conductive boom (assuming elements are mounted using one)?

The antenna elements are specific in "free space" lengths. That is with out concern for booms at all. The corrections for mounting get added after working out the design in the free space mode.

The YAGIMAX program also works with free space dimensions. There is a separate program (called TAPER) to convert from real mounted elements to free space or from free space to real mounted elements.

I figured the best test would be with these free space dimensions. The text mentioned that Steve (K1FO) optimized the designs with one of the antenna modeling programs and then verified the designs and element mounting corrections with many real antennas.

My guess is that YAGIMAX only approximates the antennas, the readme file mentions a 0.3% error. 147/144.7 is about 2% error which is too much.

The views expressed here are my own, not my employer's.
Jeff Millar, WA1HCO, Lockheed Sanders 603-885-7047

End of Ham-Homebrew Digest V93 #20
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